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THE PAPER INDUSTRY IN ITS RELATION TO CONSERVATION AND THE TARIFF¹

SUMMARY

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I. GENERAL DESCRIPTION

ALTHOUGH the present process of manufacturing paper from wood pulp was introduced into the United States about 1867, it was not until 1890 that the industry entered upon a period of marked growth and development. Improvements and economies in the method of manufacturing were devised frequently after 1890, and in seven years the price of common news paper fell from seven to two cents per pound — perhaps the lowest price it has ever attained in this country. The gradual departure of newspaper publishers from their aversion to increases in circulation (once regarded as unprofitable) led to the familiar one-cent metropolitan dailies of Mr. Pulitzer and Mr. Hearst, and their innovation was followed by others:

¹ This paper received the first prize in the undergraduate competition of 1911 for Bowdoin Prizes in Harvard College.

in rapid succession.¹ The expansion of the industry was especially remarkable after 1897, and by 1905 the capital invested in the entire paper industry had risen to \$277,000,000, and the annual product to \$188,000,000². The comparatively small annual turnover indicated by these figures is even more marked in the "newsprint" division of the industry — to which I shall confine myself in this discussion; here the annual product or turnover, \$36,000,000, was probably one-half of the capitalization.

The wood now generally used in the manufacture of news paper is spruce, cut in the forests of Maine, New York, Minnesota, and Southern Canada, whence it is floated by river, or shipped by rail, to the mills of New England, New York, and Wisconsin. Two kinds of pulp are required: mechanical and chemical. Spruce is raw material for the pulps, and the pulps are raw material for the paper. Mechanical pulp is little else than ground wood, produced by the erosion of the spruce when held in contact with common grindstones driven by hydraulic power at the rate of three revolutions per second. But the fibres of the mechanical pulp are not long enough to produce a strong paper, and there is accordingly added "sulphite" or chemical pulp made from the cooking or digesting of spruce or hemlock in huge brick-lined steel digesters containing a solution of sulphurous acid, which eats away the lignum cells of the wood and leaves the pure cellulose. After thoro mixing and bleaching, the mass of water-soaked stock (four-fifths mechanical pulp and one-fifth chemical pulp)

¹ Report and Hearings of the Select Committee of the House of Representatives appointed to investigate the conditions in the paper industry, 1908, p. 763. Hereafter referred to as "Hearings."

² Census Bulletin No. 80, p. 32.

passes to the endless wire cloth of the paper machine and then goes through several systems of cylinders and rollers which mat it firmly together, evaporate the moisture and produce a hard-finished uniform web of paper wound upon the reels as we commonly see it.

From this short description it will be evident that the equipment of a company carrying the manufacture through all of its stages consists of three parts: mechanical pulp mill, chemical pulp mill, and mill containing the paper machine.¹ The three mills of such a balanced company can be erected for about \$20,000 for each ton daily capacity of finished paper, or \$2,000,000 for a "hundred ton mill."² In the two last mentioned mills, steam power is generally used: in the chemical mill to cook the wood, and in the paper mill to dry the stock and to secure accurate control of the machine. In the mechanical pulp mill, however, steam power is too expensive, and here we find one of the two most important factors determining the location of a successful pulp mill. Water power is an absolute necessity. In order to comprehend the full significance of this fact, it will be well to consider the requirements of a mill producing 100 tons of paper per day — less than twice the amount daily consumed by a metropolitan newspaper of 300,000 circulation. Such a mill needs about 80 tons of mechanical pulp daily, and for each ton of pulp it is necessary to use from 75 to 100 horse power operating throughout the entire twenty-four hours — or about 7,000 horse power for the 100 tons. Now this is an enormous horse power, and of the total 1,647,969 horse power

¹ The machines vary in size, but are usually over 100 feet long, manufacture paper 120 to 150 inches wide, and cost about \$60,000 each.

² See estimates of Tariff Board, Report on the Pulp and Newsprint Paper Industry, 1911, p. 70.

developed in all industries by water wheels in 1905, not less than 717,989 was used in the paper industry.¹ In the last few years there has been a marked extension in the use of water power for electrical purposes, and as electricity can be transmitted for many miles, it becomes increasingly difficult for a pulp mill to survive in regions near large industrial centers where electric power is in demand for other purposes.²

Important as cheap power is, a second requirement is even more important in the location of a pulp mill, — proximity to large pulp wood areas. Cheap power and cheap wood are unquestionably the essentials for success in pulp production. Canada has these essentials to a marked degree; Maine still has them; but in New York the extensive lumbering operations have seriously depleted her once magnificent forests. England, having no pulp wood within her own borders, imports the pulp in a wet or half-dry state and manufactures, as well as imports, the finished product. Germany imports the wood from Austria, Finland, and Russia, and makes both pulp and paper. But, in general, inasmuch as 5,500 pounds of rough spruce are necessary to make one ton of paper,³ it can be laid down as fundamental that the location of a pulp mill is governed by nearness to raw material and not by nearness to market. Even the granting of favorable freight rates upon rough wood has served only in part to counteract the constant tendency in the United States to locate new mills farther and farther northward upon streams that drain the wooded areas.

¹ See Special Report of the Census Office on Manufactures, 1905, Part I, p. 514; also Census Bulletin No. 80, p. 36.

² See Special Report on Central Electric Light and Power Stations, 1907, showing increase of 900,000 horse power from 1902 to 1907 for electrical purposes.

³ See Hearings, p. 1051 and p. 1077.

Turning now to the distribution of the product, it may be said that in a certain sense there is no active market for news paper. The quality can be standardized, but news paper is not a commodity capable of ready sale because in the huge presses of the metropolitan papers the width of the press rolls varies considerably.¹ A publisher might have difficulty in securing upon short notice any considerable quantity of the desired size. There has arisen, therefore, in the "news" division of the paper industry, the custom of annual contracts² by which the manufacturer usually agrees to deliver upon the sidewalk outside the press-room such amounts (within the contract limits) as are required by the publisher, and in addition to keep in reserve stock at a warehouse, a two weeks' supply. There remains for the open market a comparatively insignificant portion of the total production. At any one time the reserve stock is so small that a three weeks' strike of the workmen in all paper mills (barring importation) would stop every newspaper in the country.

Another feature of the sale of news paper has perhaps occurred to many purchasers as they buy their copy from the news-boy. In the language of the economist, the demand is fluctuating and inelastic. It fluctuates over short periods because of sensational news happenings like political revolutions and earthquakes. It fluctuates also over long periods because of the waves of prosperity that stimulate advertising and thus increase the number of pages and purchasers. In the main, however, the demand is strangely inelastic, because a rise in the price of the blank white

¹ See Paper Trade Journal, November 11, 1908.

² See Hearings, p. 1555, for specimen of contract.

paper does not decrease the publisher's demand for it. The cost to him of the paper in a sixteen-page issue is one-half a cent, but he is powerless to raise his selling price from one cent to one and one-eighth cents on the ground of a rise in the price of white paper. Indeed, he is in the business not to curtail but to increase circulation, and he is so situated that variations in the price of his raw material cannot be shifted easily to the ultimate consumers. Of course, large diminutions in his profits in the long run will deter prospective publishers from investing their capital, and even in the short run may compel advances in advertising rates, followed, perhaps, by a decrease from 16 to 12 pages, and decreased daily sales. But it is evident that within very wide limits it is the publisher, the immediate consumer, and not the ultimate purchaser who is most affected by fluctuations in the annual contract price. A greedy monopoly, therefore, if complete and effective, might wield this quasi-taxing power to extort from the publisher of a highly remunerative newspaper, at least a share of the profits arising from highly skilful conduct of the business.¹

Before investigating the question of whether there exists such a greedy and effective monopoly, let us consider the advantages of large scale production in this industry. At the present time, some plants consist of only the paper mill proper; other establishments buy their chemical pulp; others grind but half their requirements of mechanical pulp. There seems to be no imperative necessity of conforming to the three mill type as above described. There is, how-

¹ Consider two newspapers of equal circulation, the same advertising rates and the same selling price, but one more profitable than the other. A monopoly could secure a higher price for paper from the former because there is no possibility of raising either selling price or advertising rates.

ever, one advantage in a large output of finished paper. The publisher of a large metropolitan daily dislikes to contract with a small company, which may operate but one machine of eight or ten thousand tons annual capacity. Many newspapers consume more than this amount annually, and if the manufacturer agrees to deliver paper up to his total capacity, any accident may cause him to violate the contract clause concerning reserve storage. The violation may have no disastrous consequence, but the possible inconvenience to the publisher is sufficient to induce him to patronize a company that never is forced to purchase in what is virtually a contract market. A combination of mills under one management has, in this respect, a decided advantage, for risks of accident can be widely distributed, altho a strike of the workmen in all mills of the combination may so accelerate the depletion of the reserve stock as to cause early embarrassment.

II. COMBINATION AND COMPETITION

In the late nineties, when the mania for industrial consolidation was so pronounced, the paper industry did not escape the general tendency, and the International Paper Company, or so-called trust, was formed in 1898 as the successor of about twenty-one individual concerns. At that time the company controlled probably 75% of the total output of news paper in the country; in 1900 its control had dropped to perhaps 65% of the total, in 1904 to 42%, and it is now (1911) probably about 30%. So far as it was designed to become a monopoly, it has not been successful. From the following figures it will be seen that in volume of business it has had no remarkable growth.

PRODUCTION OF NEWS PAPER IN THE UNITED STATES BY TONS

	Total	International Paper Co.
1889.....	196,053 ¹	
1899.....	569,212 ²	
1900.....		370,000 ⁴
1904.....	912,822 ³	386,000
1907.....		412,000
1909.....	1,176,000 ³	
1910.....	1,200,000 estimated	

Financially its success is even more questionable. Its outstanding bonds total over \$17,000,000, and its stock issue consists of \$22,000,000 6% preferred (upon which the dividends for the last two years have been but 2%) and \$17,000,000 of common stock, upon which no dividends have been paid since the year following the offer of the securities upon the market. Its capitalization is somewhat higher per ton of capacity than that of its most vigorous competitors, and there is ground for believing that its common stock was originally pure water.

The business policy of the trust has been very sharply criticised, especially with reference to its investment in timber lands. During its early years, part of the net earnings seem to have been invested in woodlands. In 1908 the company owned 912,685 acres in fee in the United States, 167,684 acres in Canada, and, through the medium of subsidiary companies, rented 2,689,280 acres of timber land in Canada. If it be true, as defenders of the company intimate, that these vast holdings constitute a valuable "secret reserve," it must not be forgotten that dividends can be paid therefrom only when the lands

¹ Census of 1900, Part 3 on Manufactures, p. 1020.

² Census Bulletin No. 80, p. 13.

³ Advance figures of Census Bureau. Tariff Board report, p. 21.

⁴ Hearings, p. 1102.

or timber are sold, or when the timber is manufactured at a profit. It is extremely doubtful whether the annual increase in value due to the rise in price of timber lands equals the profit that ought to arise from efficient operation of the mills. The investment in timber lands not only lends color to the charge of speculation, but it is a serious question whether the net earnings might not have been spent more wisely in new machines and equipment. Soon after the incorporation of the trust in 1898, it was charged before the Joint High Commission for the adjustment of questions between the United States and Canada that the machines of the company were antiquated.¹ Inasmuch as only one "news" machine has been added (making a total of 67),² it would seem that by 1908 the charge had received ten annual increments of truth. If the object of the trust has been to secure as much wood as possible from Canada³ in order to enhance the value of its land in this country owing to the diminishing supply, its policy in this particular has been shrewd.

But in competition with newly organized companies that avail themselves of the latest machinery, the International has found itself at some disadvantage; and the water sites for new concerns are still so numerous and the forest area so extensive that it can never again hope to maintain a monopoly of the industry as it expected to do in 1898. Nevertheless its share of the total production in the East (*i.e.*, New York and New England) is so large that it virtually dominates the market, and its representative has admitted that "possibly in a sentimental and moral way"⁴

¹ Report of the Industrial Commission, vol. 13, p. 415.

² Hearings, p. 1072.

³ *Ibid.*, p. 1029.

⁴ *Ibid.*, p. 1182.

it is in a position to control the price of print paper in the United States.¹

What the International Paper Company tried to do in the East, the General Paper Company attempted in the middle western states. This company, with headquarters in Chicago, was organized in 1904 as a selling agency for 23 mills, and until an injunction was obtained against it by the Federal government,² seemed to control the western situation, altho there is no positive evidence to show collusion with its eastern rival. The traffic agent of that combination was still employed in 1908 jointly by several of the former members of the company,³ and it is believed by many that there is enough harmony of operation to constitute a violation of the Sherman anti-trust act.

Whether or not there is actual restraint of trade, it must be said that, tho competition is often visible, there likewise comes to light evidence of combination or "coöperation." Social-business meetings have been remarkably frequent, and there is extreme friendliness among the manufacturers. Not only do all report their monthly production to the American Pulp and Paper Association, but there is in several instances a curious interlocking of interests. Action by the Federal government has resulted in the con-

¹ The control of a large part of the output seems to be concentrated in a very few hands. Out of a total daily production of perhaps 4,200 tons, the following amounts are attributed to individual mills:—

International Paper Co.....	1,476 tons
Great Northern Paper Co. (Maine)	450 "
Berlin Mills (N. H.)	225 "
W. H. Parsons Co. (Maine).....	140 "
Selling Agency in New York	500 "
Western "interests" formerly connected with General Paper Co.	700 "

² Hearings, p. 1778.

³ Ibid., pp. 1679-1683.

viction of the members of the "boxboard"¹ and "fibre and manila" (or wrapping paper)² pools, and it would not be astounding were it to be discovered that a similar pool exists among the manufacturers of news-print paper. The conviction of the Continental Paper Bag Company for participation in the wrapping paper combination only a month after the Manager of Sales of its controlling company (the news paper "trust") had stoutly maintained under oath that the trust was in no way interested in any pool, either directly or indirectly,³ leads one to doubt protestations of innocence, and to believe that this statement in particular was, to say the least, a perversion of the truth.

III. THE TARIFF

The formation of the trust so soon after the enactment of the protective tariff act of 1897 has not been overlooked by those who are prone to regard the tariff as the cause of all evil.

The act of 1897⁴ transformed the 15% *ad valorem* duties upon news paper, levied under the acts of 1890 and 1894, into a 15% duty with \$6.00 a ton as the minimum duty collectively. There was inserted a peculiar proviso which can be understood more easily after some discussion of the method of securing rights to cut timber in Canada.

The Parliament of Canada of course regulates the commercial relations of the Dominion, but the public lands in the eastern section are owned not by the Dominion but by the various provinces. These

¹ Paper Trade Journal, March 31, 1910.

² Cong. Record, 61st Cong., 1st Sess., vol. 44, p. 3468.

³ Hearings, p. 1175.

⁴ U. S. Statutes at large, vol. 30, p. 187.

provinces usually auction off the privilege to cut timber on the public or "crown" lands to the highest bidder at an "upset" price of about \$1.00 per acre, and in addition charge an annual ground rent of a cent an acre,¹ besides a stumpage tax collected when the wood is cut. Prior to May 1, 1910, the stumpage tax in the province of Quebec was sixty-five cents per cord, by which the province was able to derive a comfortable income. But if the wood was manufactured into pulp within the Dominion of Canada, twenty-five cents of the stumpage tax was refunded, leaving a net charge of forty cents per cord.²

A proviso was accordingly included in the Dingley Act that if any country or dependency (meaning the Canadian provinces) imposed an export tax on wood exported to the United States, there should be added to the duty on paper, \$2.00 per ton for every dollar of export tax so imposed. Our treasury department considered this stumpage tax of sixty-five cents equivalent to an export tax of twenty-five cents, and therefore collected $\frac{25}{100}$ of the provisional \$2.00, or fifty cents in addition to the regular duty of \$6.00. This additional fifty cents, however, was not collected upon paper manufactured from wood cut upon land owned by private parties in Quebec, because tho the provinces can direct the disposition of wood cut from their own lands, they have no right to restrict the exportation of a citizen's private property, such power being vested in the Dominion Parliament.

The evident intention of the proviso in the Dingley Act was to induce the provinces to remove their discriminatory taxes upon the export of wood. Quebec refused to do so, however, and Ontario even went a

¹ It is now \$5.00 per square mile in Ontario and Quebec.

² Hearings, p. 2939.

step further and soon absolutely prohibited the exportation of wood cut from her crown lands — for which the Dingley act had failed to provide any penalty whatever. As a result, saw mills of Michigan that had been in the habit of rafting their logs across the lake were forced to move into Canadian territory.

During the early part of the year 1907, the price of news paper in this country suddenly rose to an extent that alarmed several publishers, and their agitation through editorial and news columns led to the appointment of a select committee of the House of Representatives to investigate the "conditions" in the industry. This committee recommended¹ that the duty be lowered, conditional, however, upon the cancellation by Quebec and Ontario of discriminations against the exportation of wood.

As finally passed, the Act of 1909 provided that the duty be \$3.75 per ton, but if any dependency prohibited the exportation of wood, an additional duty of \$2.00 was to be levied, making \$5.75 on paper imported from such province. If any province taxed the exportation of wood, paper entering therefrom was to pay the amount of the export tax in addition to the \$5.75. Our Treasury department has decided that 1.4 cords of wood are required for a ton of paper,² and therefore the addition in the case of paper from Quebec was 1.4 times twenty-five cents, or thirty-five cents. Hence the total duty (up to May 1, 1910) upon all print paper manufactured from wood cut upon crown lands (but not private lands) of Quebec was \$6.10.

Upon May 1, 1910, Quebec made the next move³ by prohibiting completely the exportation of wood

¹ Their report and hearings comprise over three thousand pages.

² Paper Trade Journal, September 2, 1909.

³ *Ibid.*, April 28, 1910.

cut from her crown lands, as Ontario had done ten years before, so that at present writing there are but two rates in effect, — half of our imports of news paper entered, as cut upon private lands, with a duty of \$3.75 per ton, and the balance entered at \$5.75 per ton.¹ The victory, therefore, seems to rest with the provinces, for not only are they able to export part of their paper to us at the lower rate of \$3.75, but also to deny us the privilege of using wood from their vast areas of crown lands.

The following figures show the imports of news paper:—

IMPORTS OF NEWS PAPER INTO THE UNITED STATES²

Fiscal Year	Tons
1899	0
1900	85
1904	1,890
1907	8,733
1909	18,044
1910	43,388
1910 last six months	25,956

The imports of paper, tho they have steadily increased, formed but 4% of our total consumption in 1910.³ Since 1909 the imports have increased rapidly, but it is impossible to determine how largely the reduction in the tariff has been responsible, because a serious strike in all mills of the International Paper Company during the early part of 1910 may have necessitated the importation. It is the opinion of the writer, however, that if conditions remain as at present, increased importations may be expected in the future.

¹ Paper Trade Journal, November 10, 1910, p. 9.

² Reports of Department of Commerce and Labor.

³ Practically all of our imports of news paper come from Canada, possibly because freight on the European product is prohibitive.

The two kinds of pulp are such important constituents of news paper, that it will be necessary to state briefly the tariff rates. Under the Dingley Act, the duty upon mechanical pulp was \$1.67 per short ton, but \$1.92 in case the pulp was made from wood cut on Quebec's crown lands. In the act of 1909, mechanical pulp was admitted free if ground from wood cut on private lands; \$1.67 if ground from wood cut on the crown lands of a province prohibiting the exportation of pulp wood, and \$1.92 as before if subject to the export tax. The reader will readily excuse the collectors of revenue on our northern border for writing to Washington for full interpretation of these various provisions. In the case of chemical pulp, the duty was \$3.33 per ton under both acts, with provisos in case of discriminations.

All of our imports of mechanical pulp come from Canada; of our imports of unbleached chemical pulp, one-fourth comes from Canada, and the balance, especially the higher grades, is imported from Europe. The following table presents the figures of imports since 1899:—

IMPORTS OF PULP

Fiscal Year	Mechanical Pulp	Unbleached Chemical
	Tons	Tons
1899.....	24,000	7,000
1909.....	130,000	132,000
1910.....	160,000	187,000
1910 last six months.....	104,612	102,750

It is to be noticed that the imports of mechanical pulp since 1909 have been increasing with remarkable rapidity. Our imports form probably 16% of the domestic consumption of mechanical pulp and 15% of the chemical pulp consumption. Both the mechanical and chemical pulps are used also in making

book and other papers. At the present time one-half of the mechanical pulp enters free,¹ but the importations of both kinds of pulp are doubtless significant enough to raise the domestic price by the full extent of the duty.

Even tho half of the mechanical pulp enters free, the selling price delivered in this country would be the same for either portion. Therefore it is probable that those who do not pay the duty are really receiving a bonus. These Canadian pulp manufacturers who thus escape the duty, however, cannot permanently retain this advantage,² but will be forced by their own competition to transfer it to the private owners of woodland in Canada, who, in selling their wood can secure a higher price than do those who license the crown lands, because the licensees have a different commodity to sell. The owners of private land doubtless are not sorry to see the capital value of their timber land thus enhanced.³

An interesting phrase, fortunately of no actual effect, but potentially of far-reaching importance, was inserted in the Act of 1909 by the Conference Committee of the two houses of Congress. Under the provisions of Section 2, the maximum tariff of 25% *ad valorem* in addition to the minimum duties as previously described may be assessed against

¹ Imports of Mechanical Pulp: —

	Fiscal Year, 1910	Last 6 months, 1910
Free	80,000 tons	53,000 tons
Dutiable	80,000 "	51,000 "

² Otherwise their competitors using wood from crown land would begin purchasing private wood.

³ It is possible that such an enhancement is not of permanent duration, because whenever the time comes that the pulp imported into the United States is made entirely from this private land wood, our domestic price will tend to fall. All the pulp would then enter free. The license holders seem to obtain their wood from the provinces upon very easy terms, so it is quite conceivable that even now they meet the competition of the private owners and thereby forego a portion of that revenue which accrues because the province does not exact a maximum or "rack" rent.

any foreign country that prohibits, or imposes a duty upon, the exportation of any article in undue discrimination against the United States. This provision was undoubtedly levelled at the Canadian regulations as to wood from crown lands, and may be attributed to the influence of Senator Hale of the Conference Committee. Representative Mann, Chairman of the Select Committee that investigated the conditions in the paper industry, said in Congress:¹ "Among other things, it (the Conference Committee Bill) provides that the maximum tariff shall be imposed upon a foreign country if that country shall impose any export tax. That provision was not in the House Bill. It was not in the bill as it passed the Senate. The words 'or imposes no export duty' were inserted in Conference, and I believe were inserted at the suggestion of a few paper manufacturers in order to impose the maximum tariff upon paper coming from the Province of Quebec." It is not to be wondered at if the paper manufacturers through their associate and spokesman, Senator Hale, used their utmost efforts with the administration, to insist upon a strict construction of the provision. The existence of such a drastic clause in the tariff act, even tho it may not have been inserted clandestinely, reflects but scant credit upon the method of framing our tariff legislation. Fortunately, the President, probably influenced by the newspaper publishers in particular, and public opinion in general, decided that the Canadian restrictions were not an "undue" discrimination.

The immediate effect of the present tariff may be merely to increase the cost to the consumer by \$5.75

¹ Cong. Record, 61st Cong., vol. 44, part 5, p. 4732. See also texts of the bills in House Doc., vol. 4, pp. 288, 354, 429 (same session).

on each ton of paper; the less direct effect, however, is that the tariff permits and stimulates production in this country whereas it would more naturally take place in Canada. If the tariff were twice as high as at present, it is possible, but not probable, that the selling price of paper here would be the sum of the duty and freight, plus the Canadian cost of production, a price which would enable a profit to be derived from using American woodland that now cannot be used because of high freight charges upon the wood shipped to the mills. It is more probable, however, that under conditions of free importation of wood (as has always been the case in the past) even if the tariff on the finished product were increased tenfold, our selling price would be determined not by Canadian cost of manufacture, but largely by adding to *our* manufacturing cost, the expense of securing Canadian wood and delivering it to our mills. Of course, if these freight charges on pulp wood were enormously in excess of the freight charges upon the finished paper, then the tendency would be toward the importation of the Canadian paper as in the case of a very low duty. The selling price might then be figured as the sum of Canadian cost, freight, and our duty. Secondly, the tendency would be to utilize poorly located American woodland. As to what will, or what does, determine the proportion of American wood to Canadian wood used, it is unwise to hazard a guess.

One of the most important aspects of the situation, altho seldom seen in its full significance, is this item of freight charges upon the wood imported. Not only do we import almost one-fourth of our present consumption of pulp wood, but upon thousands of cords the transportation charges by rail amount to

a considerable fraction of the total cost of the delivered wood.¹ In some cases the freight charge is \$6.00 a cord, or two-fifths of the selling price. The paper ultimately made from this wood meets the competition of paper shipped by Canadian manufacturers, who, as time goes on, will gradually introduce improvements in use here, but not yet common in Canada. If these Canadian manufacturers are thus able to reduce their present manufacturing cost, our manufacturers will be stimulated to further economy. Not the least important of their efforts will be directed to bringing pressure to bear upon transportation companies for low rates upon the bulky raw material, pulp wood. It does seem absurd, other things being equal, to dump the waste of the manufacturing process into American rivers *after* it has been transported from Canada, instead of throwing it into Canadian rivers and shipping down but half the weight in finished product.

Indeed, the present conditions involve not only the shipment of pulp wood to mills in New York and Maine, but also shipment of paper from these mills to the large cities. Affidavits presented to Congress state that the freight charges upon portions of the wood are \$5 and \$6 per cord, whereas the selling price of the wood delivered varies from \$9 to \$15. Upon the finished paper, the freight from the mills to Boston and New York is between \$2 and \$3 per ton; if shipped from Canadian points, about \$4. Hence transportation charges upon the raw material and upon the finished product are at least one-fifth of the total charge which the publisher is called upon to defray. Often the traffic agent is compelled to grant

¹ See Hearings, pp. 1050-1, for rates on pulp wood.

a low rate upon the pulp wood because he thinks otherwise he would have no paper to transport; another line might get it if all the finished product were made in Canada; and the shipment of both paper and pulp wood appeals to him as an increase in the volume of traffic, and consequently a source of profit to his company. Yet just as decisively it seems to the writer to be, from the view point of the community at large, an uneconomical waste of effort.¹ The freight agent feels that the low rate may maintain the manufacturer in business, and if so, there will be a traffic in mill supplies, which, regarded as an additional increment of business for the railway, is pure gain. But he forgets that if the manufacturer were in some other business in which natural advantages are greater, there would be not only as much traffic in supplies, but higher rates could be charged on the raw materials for the other industry, than can be paid on the bulky pulp wood.

It must be admitted, in this connection, however, that if the tariff is abolished and competition becomes keener, there might be a still stronger pressure upon the railroads for lower rates on the raw wood, and the present condition might become somewhat accentuated. Likewise, it is probable, that as a larger area of Canadian timber land is drawn upon, there will appear in Canada the same practice of shipping wood to the Canadian mill and shipping paper thence to the consumer in the United States. But something will still be saved over the present method, because it will be less expensive to ship the pulp wood from the forest to the Canadian mill than from the same forest to the

¹ Hearings, p. 3123. Rates from Canadian points to our western cities are the same as from our eastern mills.

American mill still farther away.¹ And, too, if the reader will look at the map of eastern Canada, he will be impressed by the large number of long rivers flowing southward into the St. Lawrence that greatly facilitate the transportation of logs by water to the Canadian mills.²

However important may be the incidental effects of the tariff, it is fair to say in general that the duty upon news paper, in comparison with the ordinary protective duties, is, and has been, very low: 15% under the act of 1897, and in 1909 nominally but about 9%. The nominal rate of \$3.75 (or about 9%), however, now applies to but half the imports of news paper. Indeed, unless the Canadian provinces can be persuaded, or intimidated, into removing their prohibitions upon the exportation of wood, \$5.75 will tend more and more to become the usual duty, owing to the eventual diminution of the wood yield from the timber lands in Canada owned by private citizens.

But even if the tariff raises our domestic price above the Canadian price to the full extent of the duty, the total tribute paid by the consumers of news paper is not greater than \$5.75 multiplied by the number of tons annually consumed (1,100,000) or roughly about \$6,000,000. Moreover, were it not for the fact that our paper companies are the owners of extensive tracts of timber land, it might even be said that the duties upon the two kinds of pulp reduce the net protection to the manufacturer by at least one-third of the \$5.75. Assuming that altho

¹ Under the latter system, of course, there is a saving in the transportation of the finished paper, but this is less than the extra cost of shipping the wood.

² A mill at Ottawa receives logs floated from a point 400 miles upstream.

part of the mechanical pulp enters free, the selling price of the whole supply is raised by the full duty of \$1.67, then the duties upon the chief constituents of news paper may be figured as follows:—

$\frac{1}{2}$ ton chemical pulp at \$3.33 per ton	\$0.66
$\frac{1}{4}$ ton mechanical pulp at \$1.67 per ton	1.33
	\$2.00

For all those manufacturers who use imported pulps, these duties enter as a part of cost of production, and are not a source of profits, so that the excess in price of paper due to the tariff and paid by the consumer goes partly to the government in duties, and partly, as already pointed out, to the private owners of Canadian timber land because these owners possess an advantage over neighbors who license crown lands.

In general, too, it must be emphasized that the industry is not in a state of normal equilibrium either here or in Canada. It is not so here, because the perplexing uncertainty of legislation and of future wood supply makes investors wary in constructing new mills that might more profitably be located nearer Canadian forests. It is not so in Canada, because the meager development of the industry has not allowed time to determine whether the best location is in Quebec or in the more remote regions of Labrador and Newfoundland.

Except with regard to wood supply, it seems to be the fact that the manufacturing conditions in Canada conform very closely to those in the United States. The figures given in the report of the Tariff Board indicate that there is no great difference in labor cost *per ton* of finished paper:—

AVERAGE COST OF PRODUCTION OF NEWSPRINT PAPER

	United States	Canada
Labor cost.	\$6.29 per ton ²	\$5.63
Cost of wood	14.32 " "	8.73
Total cost ¹	32.88 " "	27.53

It will be seen that in either country the labor cost is not of paramount importance, and that the advantage of Canada lies in its cheaper wood, or rather in the fact that freight charges upon that wood are negligible. Skilled laborers in Canada are paid high wages, and some of them are former Americans whom only higher wages could induce to cross the border. Unskilled laborers, perhaps, are paid smaller wages than in this country, but they are seemingly less efficient. The wearisome reiterated statements of manufacturers concerning wages paid by our northern competitors lose their force entirely when we observe cost of labor per unit of output. When considered in conjunction with trade journal reports of the lax methods of the Canadian mills, these statements ring very hollow. So far as alterations take place in general prices, in standards of living, or in labor conditions generally, it is likely that Canadian manufacturers will be affected in the same way and in approximately the same degree as the American producers.

To conclude this phase of the discussion of the past effect of the tariff, the writer believes that until 1904 or 1905 the tariff did not raise the selling price

¹ Not including depreciation or interest on investment.

² The figure \$6.29 is obtained by adding to the labor cost in the paper mill (\$3.27) the cost of the labor performed in the manufacture of ground wood pulp and sulphite pulp. The American cost of the ground wood used in a ton of paper is given as \$13.27, which is the cost of 90.9% of a ton at the average cost of \$14.59 per ton of ground wood. This is considerably more than the 80% of a ton usually calculated, but as the proportion in Canada is 88.8%, the discrepancy does not seriously impair the value of the table. Tariff Board Report, p. 39.

of paper to any noticeable extent, for it is then that the prices of American spruce display a marked upward tendency.

IV. CONSERVATION

But even if it could be demonstrated that there is no economic waste in the shipment of a weight of pulp wood from Canada double the weight of the finished product, even though the labor and operating cost of manufacturing were higher in Canada than in this country, and even if the tariff were to exact no tribute whatever from consumers, there is one consideration of so great portent to our future industrial welfare as to outweigh all others and stamp the duty upon paper as distinctly unwise and harmful.

In the matter of wood supply, we are at a serious disadvantage. We are suffering the consequences of a past and present wanton destruction of forests that is in striking contrast with the saner policy of European countries, or with the more prudent attitude of Canada. There was a time when our forests were described as inexhaustible, and we have continued to act on that assumption long after we have realized its falsity. If the present consumption of spruce in the East and North (3,750,000 cords for lumber and 1,500,000 cords for pulp) is maintained for but twenty years, the entire supply will be destroyed.¹ It requires 75 years, however, to grow a good-sized spruce forest from the seed and at the present rate of consumption we shall soon find ourselves with no supply of our own, and moreover probably debarred from Canadian tracts. With our timber area decreasing rapidly, it is by no

¹ Circular 166 of the Forest Service, 1909, p. 9. See also p. 22 and p. 72 of Forest Products No. 10, 1908, entitled Forest Products of the United States, 1908.

means strange that we have turned in the past to Canadian sources. As has already been noted, the importations of pulp wood (almost entirely spruce) are now about one-fourth of our total consumption. The following figures show the situation.

	Importations of Pulp Wood	Total Consumption
1899	368,000 cords ¹	1,956,310 cords
1909	907,000 "	4,002,000 ² "
1910	931,000 "	

The above figures, indicating the actual practice for years past of importing wood, are perhaps the most effectual refutation of the statement made with such brazen disregard for accuracy that we have "enough" wood of our own. It is true that the forest area of New York, New Hampshire, Maine, and Vermont is estimated at 32,900,000 acres,³ of which the paper companies own at least 2,500,000 acres; it is true that this area might yield four million cords annually if only the annual growth were cut. But it is just as unerringly true that if more than the annual growth is cut, the total area eventually will be diminished. The quantity of output may be the same whether only the annual growth of a large region is cut or a small area is stripped bare of all its timber. The blame attaching to our past conduct lies not in the practice of cutting a quantity unnecessarily large, but in this manner of "cutting clean" — of devastating an area of its entire stand of timber.

Of even greater importance than the destruction of forests may be the loss entailed through abnormal variations of the volume of water in our swift-flowing

¹ Census Bulletin No. 80, p. 12.

² Circular issued October 18, 1910, Bureau of the Census Department of Commerce and Labor.

³ Circular No. 166, Forest Service.

rivers. Probably all readers are familiar with the recent literature upon the subject. Therefore it is sufficient for the present purpose merely to remark that the denuding of hillsides leads eventually to summer droughts and spring floods, many of which seriously affect the water that drives the wheels of factories scores of miles down the river. Surely a section of our "protective" tariff that conduces to such a result merits the heartiest condemnation.

Many defenders of the paper industry resent the charge that they waste resources, and allude to the fact that the paper industry consumes but 2% of the total lumber output of the country. In comparison with the total cut of all kinds of lumber, the amount of spruce cut for pulp wood is insignificant. But there is an enormous amount of lumbering in the west and south which has little bearing upon the price of paper, or upon the devastation of the lands in those states where paper is chiefly made. In the paper producing states, almost half of the spruce cut is used for pulp wood, and altho there has been a decrease since 1899 in the amount of spruce cut for lumber, it has been almost offset by the increase in the amount used for pulp.¹ The following are the detailed figures:—

SPRUCE CUT IN PAPER PRODUCING STATES¹
(New York, Maine, Vermont, New Hampshire, and Lake States)

	For Lumber	For Pulp Wood
1899.....	2,250,000 cords	900,000 cords
1908.....	1,700,000 "	1,300,000 "

Moreover, the paper industry makes use of smaller and younger trees than the lumbering industry is generous enough to spare.

¹ For figures of 1908: Forest Products No. 10, pp. 22, 72. For figures of 1899, see Census of 1900, volume on Manufactures, part 3, pp. 833-835, 842-843, 1030-1.

In further defence of the paper industry, representatives have pointed out that the industry is using lumber refuse, and odds and ends that would be burned were it not for the production of pulp. So much is true. It is true, also, that there are many opportunities to combine large lumber and pulp mills and thus to save odds and ends. But it must not be forgotten that even though the tariff be removed, those American mills that utilize lumber refuse doubtless could still survive because of their advantage over Canadian mills in nearness to American markets.

Altho censurable from the public point of view, the "clean cutting" of an entire area is the inevitable consequence of the desire for gain upon the part of the individual woodland owner. He trusts to the altruism of "the other fellow" and merely looks askance at the depletion of the supply. There is, to be sure, some conflict of interest. Taxes on his investment and the danger of a forest fire incite him to cut all his wood at once. On the other hand, the certain rise in price in the future if all other owners so cut their wood, leads him to hold his wood for a profit. Now it seems probable from the large importations of wood and from the extensive area of timber land still remaining in the United States, that the expected rise in price has acted powerfully enough in the past to deter the paper companies from cutting all their wood at once.¹ But when once the reluctance of the

¹ The following figures may be of interest :

	Valuation of Pulp Wood Imports	Quantity
1906.....	\$4.43 per cord	322,758 cords
1907.....	4.84 " "	827,089 "
1908.....	5.79 " "	810,256 "
1909.....	6.18 " "	907,963 "
1910.....	6.55 " "	931,731 "

domestic owner to cut this wood is overcome, he usually strips the entire region;¹ this reduces the area which will yield next year's supply, increases the desire of others to hold for a rise in price, and compels increased importations from Canada.

The more accurate statement of this pressure upon the supply of wood is that the annual consumption exceeds the annual reproduction of the available forests. Virgin forests do not increase in their stand of timber; the mature trees die, rot, and are replaced. If the virgin areas are not cut, the annual growth, the present annual rot, so to speak, is forever lost. If, however, these forests were cut periodically of their largest trees (those that monopolize light and moisture), the annual growth after cutting would actually exceed the present amount of reproduction under natural conditions. Indeed, the Forestry Department recommends the selective cultivation of spruce because of three prominent characteristics of the tree: "its successful reproduction and seedling growth under shade, its tolerance and *ability to recover from long suppression*, and the presence of trees of all ages in typical spruce forests."² The success of European countries in reforesting under scientific methods leads one to believe that the value of this additional growth might exceed the cost of frequent cutting, and the further, though negative, advantage of not destroying valuable water powers points to prompt action and permanent control by the national government as a policy worthy of support by all far-sighted citizens.

Will not the recent prohibition of Quebec intensify the drain on our forests? We shall be debarred from

¹ There are occasional exceptions.

² Forestry Silvical Leaflets, No. 15, White Spruce.

the use of 150,000 cords heretofore secured from her crown lands.¹ To meet the demand for wood, the private owners may raise their price and thus hasten not only the extinction of their own supply, but also hasten the time when resort must be had to the crown lands. From the following table, it will be seen that the private lands are but a small fraction of Quebec's total forest area.²

FOREST AREA OF QUEBEC³

Held by private parties	5,000,000 acres	
Crown lands, unlicensed	80,000,000	"
Crown lands, licensed	45,000,000	" of which at least 3,000,000 are held by American companies.

An effect by no means incidental to this prohibition and consequent rise in price will be the utilization of timber lands in the United States located too unsuitably for profitable operation under the present conditions, and also the more intensive operation of lands already in use. In economic phraseology, our "margin of cutting" will be lowered.

V. CONCLUSIONS AS TO THE TARIFF

Perhaps it will be clear, after this discussion, that those American plants owning tracts of timber in the immediate vicinity of the mill have an advantage over any neighboring mills that are forced to im-

¹ Paper Trade Journal, November 3, 1910, p. 8.

² It is by no means improbable that a conflict will arise between settlers who desire further alienation of the crown domains, and the manufacturing interests that desire to encourage the growth of the paper industry there, by preventing further exportation of wood to the United States.

³ Hearings, pp. 2886-7. These are the figures of the forester to the department of crown lands in Quebec, but are mere estimates because as yet there has been made no reliable survey.

port wood from Canada and pay a transportation charge of \$3 or \$4 per cord.¹ This extra profit is substantially an economic rent accruing to the paper company in its capacity as a woodland owner, and the manufacturer who owns no wood will pay to any owner the same price as for the Canadian material upon which the freight charges are incurred.

These mills of ours that are well located with regard to market and to wood will not be exterminated upon the abolition of the tariff upon news paper, except under the following condition. If the market is opened to Canadians, our manufacturers can compete only if they produce their pulp at a price low enough to yield a profit. To do this, they must secure spruce at correspondingly low prices. But the general demand for spruce as lumber may be so strong that buyers of lumber can bid more for the spruce than can the manufacturers who desire to use it in making pulp. In that event even our best mills would be unable to meet the competition of Canadian mills that have but slight transportation charges to pay upon their wood, and eventually must be dismantled or replaced by lumber mills. The abolition of the duty upon paper will merely transfer to the consumer, in the form of a lower price for paper, the tribute which he now pays directly to the paper company, indirectly to the woodland owners as an economic rent — a rent which is possible only because of the waste resulting from the double transportation of the finished product and the pulp wood from Canada as raw material for a portion of that finished product, instead of transporting but half as much of the finished product.

¹ It is possible that mills fortunate as to wood supply have disadvantages in other respects that tend to cancel this particular situation rent.

Quite contrary to the stand adopted continually by the manufacturers in their briefs presented to Congress, the writer holds that the abolition of the tariff will not compel the more speedy destruction of our forests in order to meet Canadian competition. The free admission of paper may mean not even any diminution whatever in the capital value of timber land, for the spruce now used for pulp wood may be used for lumber. Even if a part of the capital value were destroyed, no owner would hasten on that account to destroy the whole forest merely because it yielded less income than previously. Indeed, when the tariff is abolished, *less* wood will be cut than at present, because the wood now shipped from remote locations in the United States will not be able then to sell (as pulp wood) at a profit.

It is of course in the nature of things that some wood in Canada will be secured at a greater distance from the mills on good water sites than other wood, and the phenomenon of situation rent will appear in Canada to a more marked degree as their production increases and a larger area of woodland is forced into use. In order to compensate for the poor location of the far northern timber limits, the provinces auction them off at a lower original "upset" price, even tho the stumpage tax is the same in all cases.

Predictions are seldom useful, and in this case they are especially hazardous, for such contingencies as the discovery of a more economical process of treating lumber refuse, or of an entirely new raw material, or far-reaching alterations in rates of transportation may revolutionize the present methods and upset all calculations based upon existing conditions. Nevertheless, the writer ventures to state his belief that so long as spruce is not supplanted by other woods, and

even tho the tariff is maintained, our unsuitably located mills will gradually be driven from the field by Canadian mills. It is extremely doubtful, however, whether Canada even now could produce more cheaply than the majority of our best mills were it not for the expensive transportation of pulp wood from Canada. At least there is almost no doubt that if, by afforestation, there could be recreated in the vicinity of our manufactories, a large supply of pulp wood, we could retain the industry because of natural advantages over Canada in nearness to market and in the purchase of machinery and miscellaneous supplies. Competition for water powers in Canada or compliance with demands for higher wages may seriously increase operating expenses of Canadian manufacturers, offset only partially, perhaps, by the general improvements arising from the expansion of the industry. But theirs is a distinct advantage in nearness to the wood areas. American capital is already extensively invested in Canadian water sites and woodlands, and the day may be not far distant when the same manufacturers who now, as American citizens, advocate the tariff in their anxiety to protect American laborers, will clamor just as loudly, as investors in Canada, for the abolition of the tariff. Then there may arise, conceivably, an "All American" paper monopoly.

ROSCOE R. HESS.